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Changes in Population of Sheep and Cattle 1959-1967

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The June returns of the Ministry of Agriculture provide information regarding the population of cattle and sheep on a county basis. The changes over the period 1959-1967 are as follows for England and Wales:-

	Total Cattle and Calves	Total Sheep and Lambs	Total Crops and Grass (acres)	Total Rough Grazing (acres)
1959	8,435,164	18,216,898	24,471,214	5,034,301
1967	9,002,693	19,661,888	24,297,903	4,783,715
Change	+ 567,529 (+6.7%)	+1,444,990 (+7.9%)	- 174,311 (-0.7%)	- 250,586 (-5%)

The change in acres of grassland over this period were

	Total clover and rotation grasses (acres)	Total Permanent Grass (acres)
1959	4,409,698	10,966,432
1967	3,604,203	10,142,398
Change	- 805,495 (-18.3%)	- 823,534 (-7.5%)

Thus more stock is being carried on less grass. The division of grass into grazing and mowing was:-

	Total grass for grazing (acres)	Total grass for mowing (acres)	
1959	10,023,478	5,352,652	(34.8%)
1967	9,177,185	4,569,916	(33.2%)
Change	- 846,293 (-8.5%)	- 782,736 (-14.6%)	

Some idea of the increased efficiency of grassland use can be obtained by simply dividing the total number of cattle and calves by the grassland grazing area, giving:-

1959 0.84 1967 0.98

which suggests an improvement of some 16½% in 8 years.

It is, however, useful to consider two other indices which indicate a preference for animal husbandry, namely

Cattle Index being the total of cattle and calves divided by the total acreage of crops and grass, and multiplied by 100.
(This ignores the number of sheep on farmland as distinct from rough grazing),

/and

and Stock Index being the total of cattle and calves plus one seventh of the total sheep and lambs divided by the total acreage of crops and grass plus two thirds the acreage of rough grazing and multiplied by 100.

The comparison of 1959 to 1967 now becomes

	Cattle Index	Stock Index
1959	34	40
1967	37	43

These indices can be worked out for each county, so that it is possible to see where the changes have occurred. This could be represented in the form of a map, but it is more sensible and instructive to examine the changes in relation to the climate.

The most suitable climatic factor is the average "effective transpiration" which basically represents the available incoming energy in summer for grass production when there is no limitation due to absence of soil moisture, due account being taken of soil type. County averages of this factor have been worked out, and the counties can be grouped together in nine Grades (Grade 1 being the most suitable climatically). These groupings will differ slightly according to whether only the 'farmland' (or crops and grass) area is considered, or whether the rough grazing is also included. In counties with a large proportion of rough grazing on higher land, the average effective transpiration for the total (farmland plus rough grazing) area is less than that for the farmland alone.

The changes within these gradings were:-

	Cattle Index				Stock Index		
	1959	1967	Change		1959	1967	Change
Grade 1	47	55	+8	Grade 1	51	61	+10
Grade 2	45	52	+7	Grade 2	50	58	+ 8
Grade 3	40	45	+5	Grade 3	47	54	+ 7
Grade 4	39	42	+3	Grade 4	41	45	+ 4
Grade 5	35	38	+3	Grade 5	39	40	+ 1
Grade 6	32	32	0	Grade 6	34	34	0
Grade 7	23	21	-2	Grade 7	28	26	- 2
Grade 8	19	16	-3	Grade 8	20	17	- 3
Grade 9	15	12	-3	Grade 9	16	13	- 3

Not only the distribution, but also the changes in distribution are in accordance with the effective transpiration. Assuming the weather factor is correct, this shows that farmers are reacting efficiently to the climate, or alternatively, assuming the farmers are efficient, then the weather factor is valid.

The correlation coefficient between the mean effective transpiration of the grades and either index was 0.98 in 1959 and 0.99 in 1967.

The changes in population, 1959-1967 are shown for each county in the two tables, together with the cattle and stock indices.

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If a factor of three-quarters instead of two-thirds had been used in calculating the stock index, the values for the counties with a large proportion of rough grazing would have been reduced slightly, but the general picture would have been unaltered. For example the stock indices for Grades 1-4 would alter from 61, 58, 54 and 45 to 60, 57, 52 and 44 in 1967.

The counties with stock index reduction (of 2 or 3) caused by this change of estimate of the worth of rough grazing, would be Glamorgan, Denbigh, Montgomery, Cumberland, Westmoreland, Caernarvon, Radnor, Brecon, Cardigan and Merioneth, but the county of Flint, the highest of them all, with only 10% rough grazing, would be hardly altered.

Refinements could be introduced by allowing weighting factors for the age of calves or lambs, or by changing the equivalence of seven sheep to one cow, but the general picture of close correspondence with the climate would remain unaltered.

Any comments or suggestions on this paper should be sent to the Author.

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Total Cattle and Calves Population - The Cattle Index

Counties with increasing population 1959-1967 (Change per 100 acres farmland)

GRADE			Cattle Index
2	Cumberland	+11.3	68
4	Derbyshire	+ 9.5	54
2	Radnor	+ 9.4	40
1	Flint	+ 8.8	64
2	Montgomery	+ 8.8	52
2	Pembroke	+ 8.8	55
1	Cornwall	+ 8.6	56
3	Cardigan	+ 8.5	46
2	Westmoreland	+ 8.1	63
1	Lancashire	+ 7.7	55
1	Cheshire	+ 7.7	61
1	Carmarthen	+ 7.5	50
2	Brecon	+ 6.9	42
3	Staffordshire	+ 6.9	53
1	Glamorgan	+ 6.8	49
1	Caernarvon	+ 6.5	59
2	Devon	+ 6.5	48
2	Denbigh	+6.3	52
1	Monmouth	+5.7	45
2	Shropshire	+4.8	49
2	Merioneth	+4.7	46
1	Anglesey	+4.2	54
3	Dorset	+4.2	46
5	West Riding	+3.9	41
2	Somerset	+3.8	51
4	North Riding	+3.7	40
6	Surrey	+3.4	39
6	East Sussex	+3.0	41
5	Northumberland	+2.2	41
4	Hereford	+2.0	40
5	Durham	+1.7	39
6	West Sussex	+1.7	37
6	Leicestershire	+0.9	41
5	Worcestershire	+0.8	34
8	Isle of Wight	+0.7	45
6	Warwickshire	+0.3	34
7	Middlesex	+0.2	27

Counties with decreasing population 1959-1967 (Change per 100 acres farmland)

GRADE			Cattle Index
3	Gloucestershire	-0.1	36
6	Buckinghamshire	-0.1	34
7	Nottinghamshire	-0.3	29
5	Hampshire	-0.8	32
4	Wiltshire	-1.0	37
8	Bedfordshire	-1.0	18
6	East Riding	-1.4	21
6	Oxfordshire	-1.4	28
7	Hertfordshire	-1.6	22
7	Kent	-1.7	20
8	Suffolk	-1.9	16
9	Cambridgeshire	-2.3	8
9	Huntingdonshire	-2.4	11
7	Rutlandshire	-2.5	24
8	Lindsey	-2.5	17
9	Essex	-2.5	16
7	Norfolk	-2.6	17
7	Kesteven	-2.6	15
6	Berkshire	-2.7	28
7	Northamptonshire	-3.5	28
8	Holland	-4.3	6

Total Cattle and Sheep Population - The Stock Index

Counties with increasing population 1959-1967 (Change per 100 acres)

GRADE			Stock Index
3	Radnor	+13.5	66
1	Flint	+13.1	75
3	Cardigan	+12.1	54
2	Montgomery	+11.8	67
2	Denbigh	+11.3	69
1	Lancashire	+10.9	56
2	Carmarthen	+10.6	56
2	Glamorgan	+10.0	52
4	Derby	+ 9.7	52
1	Cheshire	+ 9.3	61
1	Cornwall	+ 9.1	60
2	Pembroke	+ 9.1	56
1	Monmouth	+ 8.3	61
2	Devon	+ 8.3	56
3	Brecon	+ 8.0	55
3	Caernarvon	+ 7.8	58
3	Stafford	+ 7.6	57
1	Anglesey	+ 7.4	69
3	Cumberland	+ 7.3	60
3	Merioneth	+ 6.1	52
2	Shropshire	+ 5.5	60
3	Westmoreland	+ 5.3	56
6	Surrey	+ 5.2	41
3	Dorset	+ 4.9	47
2	Somerset	+ 4.7	56
4	West Riding	+ 4.2	42
4	Hereford	+ 3.9	60
4	North Riding	+ 3.5	42
5	Sussex	+ 3.4	44
5	Durham	+ 2.8	43
5	Worcester	+ 2.6	44
5	Northumberland	+ 1.9	45
7	Middlesex	+ 1.7	27
3	Gloucester	+ 1.0	43
5	Hampshire	+ 0.7	31
8	Isle of Wight	+ 0.7	43
5	Warwick	+ 0.6	43
4	Wiltshire	+ 0.4	38

Counties with decreasing population 1959-1967 (Change per 100 acres)

GRADE			Stock Index
7	Nottingham	-0.2	32
8	Bedford	-0.4	21
6	Buckingham	-0.5	41
5	Leicester	-0.6	46
6	Rutland	-1.3	35
7	Kent	-1.3	34
6	Berkshire	-1.4	30
6	Hertford	-1.5	23
6	Oxford	-1.9	33
5	East Riding	-2.3	29
9	Essex	-2.4	17
9	Cambridge	-2.6	9
7	Norfolk	-2.7	18
7	Lindsey	-2.8	22
8	Suffolk	-2.9	17
7	Kesteven	-3.0	20
8	Holland	-4.0	8
7	Northampton	-4.2	38
9	untingdon	-4.8	13